

Flickner Innovation Farm

Overview

Facebook

A banner for the Flickner Innovation Farm. At the top left is a green leaf logo. To its right, the text "FLICKNER INNOVATION FARM" is written in large blue capital letters, with "growing for the future" in green below it. The banner features a grid of logos for various partners: AquaSpy, American Robotics (AR), Climate Field View, Heartland Irrigation, Inc. (Specializing in Drip Irrigation), Heartland Soil Services (Unless you test, it's just a guess), KARTA (Kansas Ag Research & Technology Association), K-State Research and Extension, Phytech, Terraviva, R7 Field Forecasting by Winfield United, Inman Irrigation, Kansas Corn Commission, MKC (Shared growth. Shared success.), Netafim, and the City of Wichita. At the bottom, it says "MOUNDRIE, KANSAS" and "WWW.KCARE.K-STATE.EDU". The background of the banner has blue and green wavy lines at the bottom.

FLICKNER INNOVATION FARM
growing for the future

AquaSpy™

AR
AMERICAN ROBOTICS

CLIMATE FIELD VIEW

HEARTLAND IRRIGATION, INC.
Specializing in Drip Irrigation

HEARTLAND SOIL SERVICES
"UNLESS YOU TEST, IT'S JUST A GUESS"

KARTA
Kansas Ag Research & Technology Association

K-STATE
Research and Extension

Phytech

Terraviva

R7 Field Forecasting
by WINFIELD UNITED

INMAN IRRIGATION

KANSAS CORN COMMISSION

MKC
Shared growth.
Shared success.

NETAFIM™

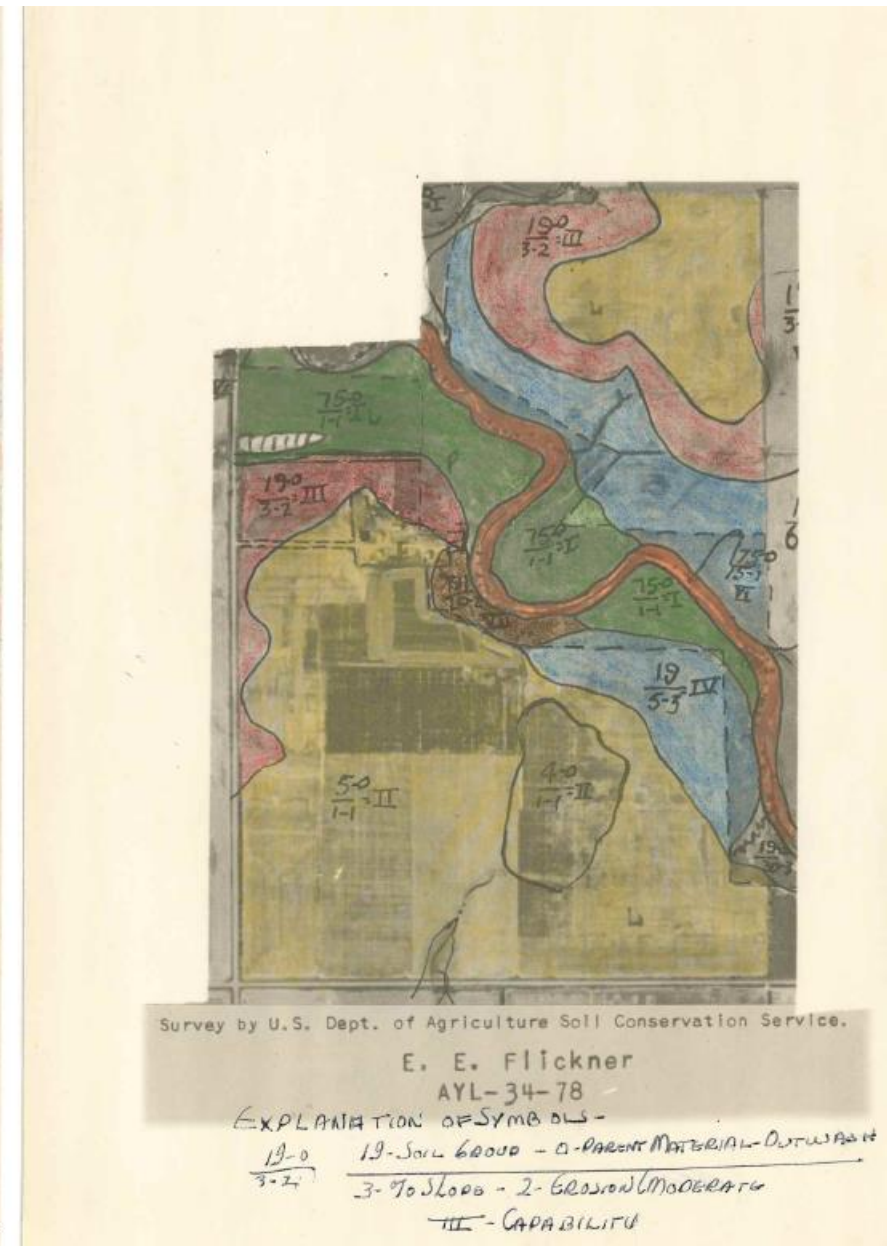
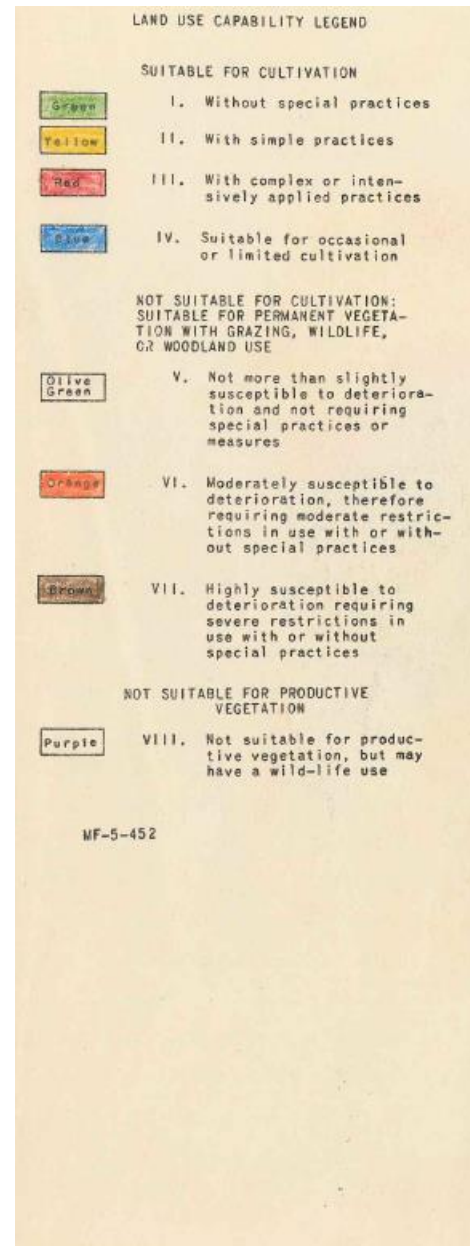
CITY OF WICHITA

MOUNDRIE, KANSAS
WWW.KCARE.K-STATE.EDU





December 1955



1946 McPherson County Soil Conservation District
Farmer-District Cooperative Agreement Map

Flickner Innovation Farm Research Team

- Susan Metzger (water)
- Andres Patrignani (soil)
- DeAnn Presley (covers)
- Dorivar Ruiz Diaz (fertility)
- Ignacio Ciampitti (protein, planting population)
- Lee Wheeler (irrigation)
- Peter Tomlinson (water)
- Ron Graber
- Sarah Lancaster (weeds)
- Gaurav Jha (precision)
- DeePak Joshi (precision)
- Raj Khosla (precision)
- Romulo Lallato (wheat)
- KGS – Erin Seybold, others (water quality)

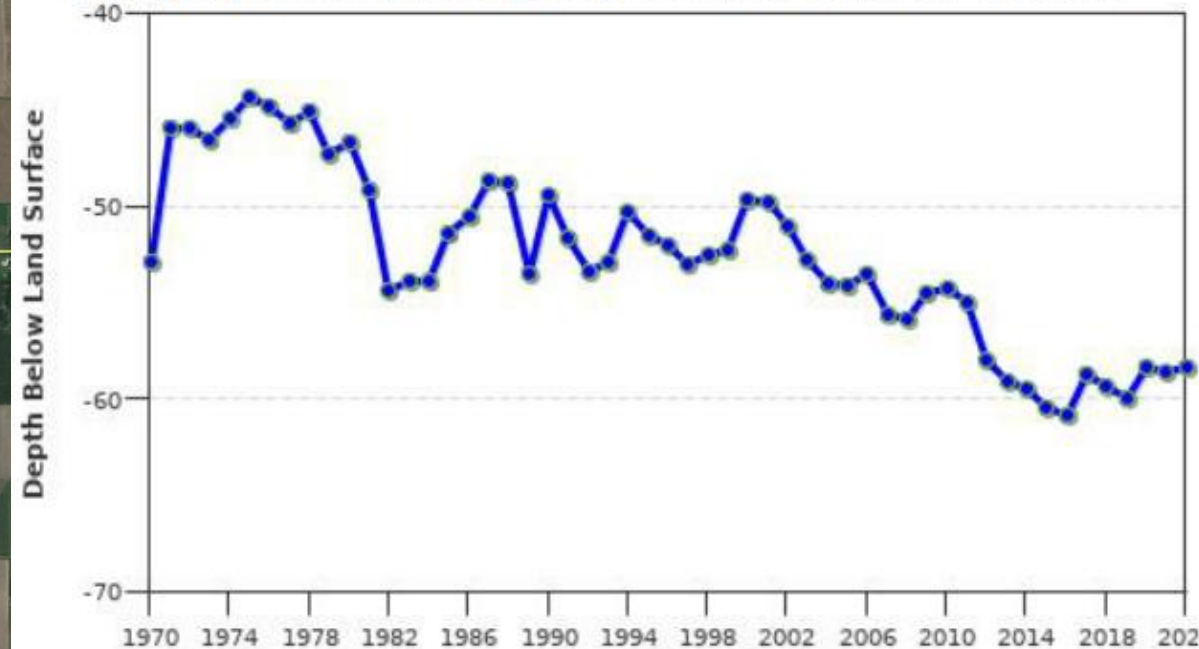
Flickner Innovation Farm

2.75 miles west of Moundridge, Kansas on Arrowhead Avenue

32,552 – 1979
40,699 – 1992

<https://www.kcare.k-state.edu/>

Hydrograph- Annual Average Depth to Water Below Land Surface



City of Moundridge – MP3 (vested); 30,413 (1977); 35,695 (1981)

4,894 – 1955

29,958 – 1977

4,537 – 1955

47,591 – 2010

37,213 – 1984

Google Earth

©2018 Google



1 mi

SDI installed **2004**; 154 acres; 500gpm & 200gpm

SDI installed **2005**; 71 acres

PMDI installed **2019** on a 1996 Valley (3 span) & 2005 Reinke (4 span); 123 acres; 450gpm

3 span Valley collapsed July 2024. Starting in 2025, ~140 acres will be irrigated with a 360 Rain in **2025**

Rotor 4 span pivot; 33 acres

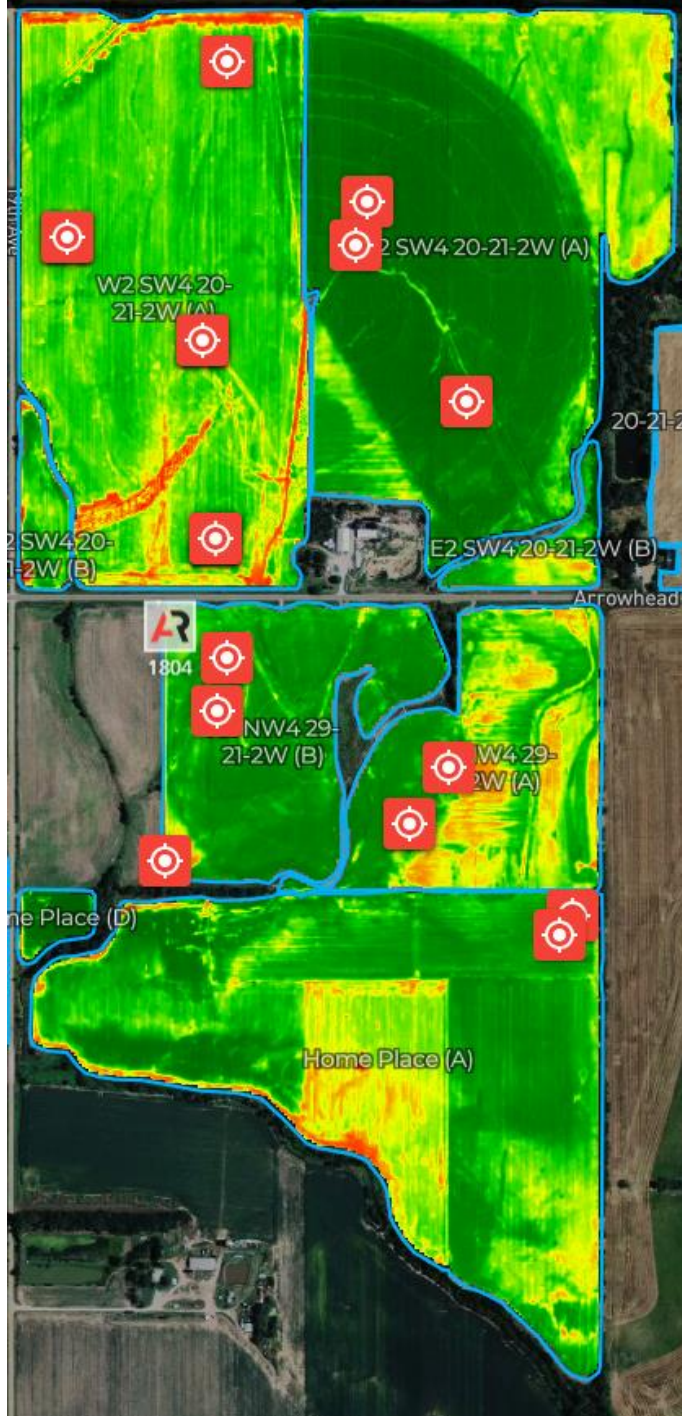
SDI on 40" installed **2020**; 23 acres

SDI installed **2001**; 220 acres; 800gpm & 600gpm

SDI installed **2010**; 40 acres

SDI installed **2006**; 80 acres; 650gpm

SDI on 40" installed **2015**; 78 acres; 650gpm

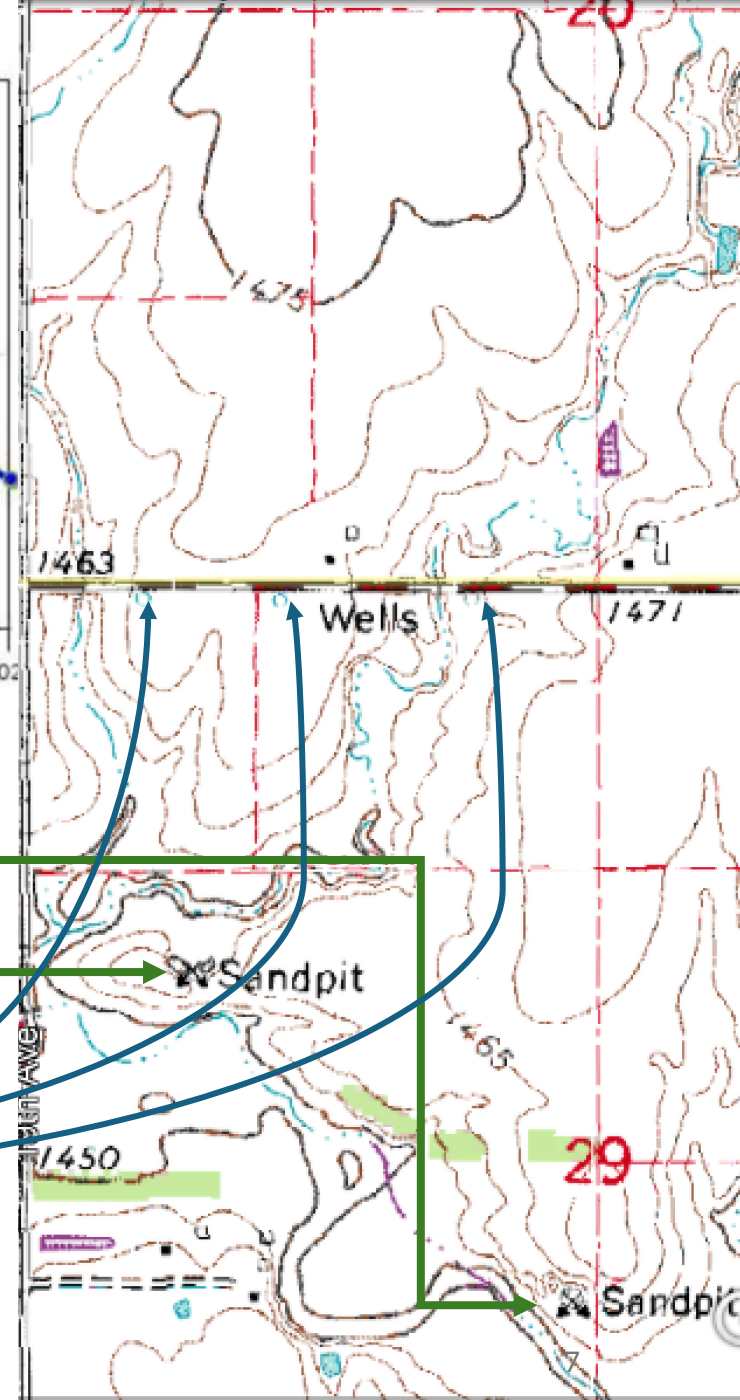


Hydrograph- Annual Average Depth to Water Below Land Surface

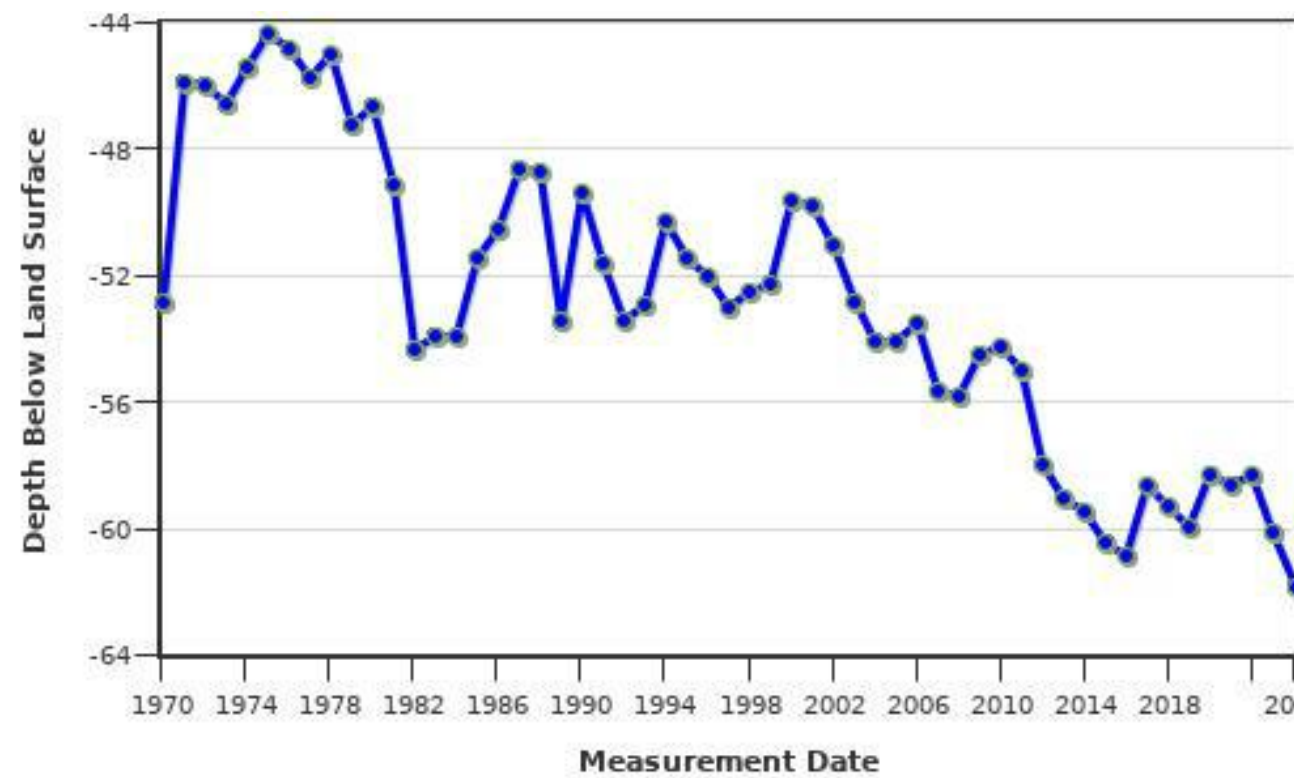


What are we dealing with?

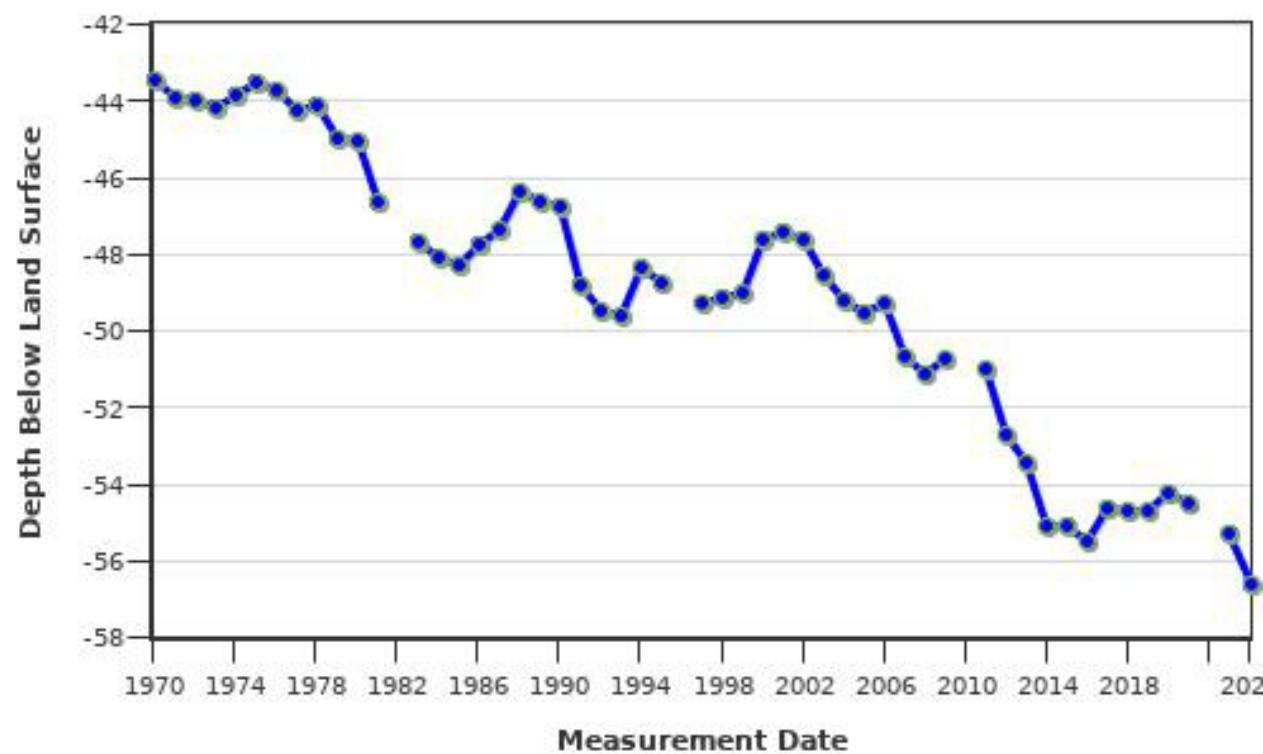
- Topography (>25' change)
- Sand pits
- “Sand Creek”
- 3 muni wells
(quality concerns)
- Declining aquifer



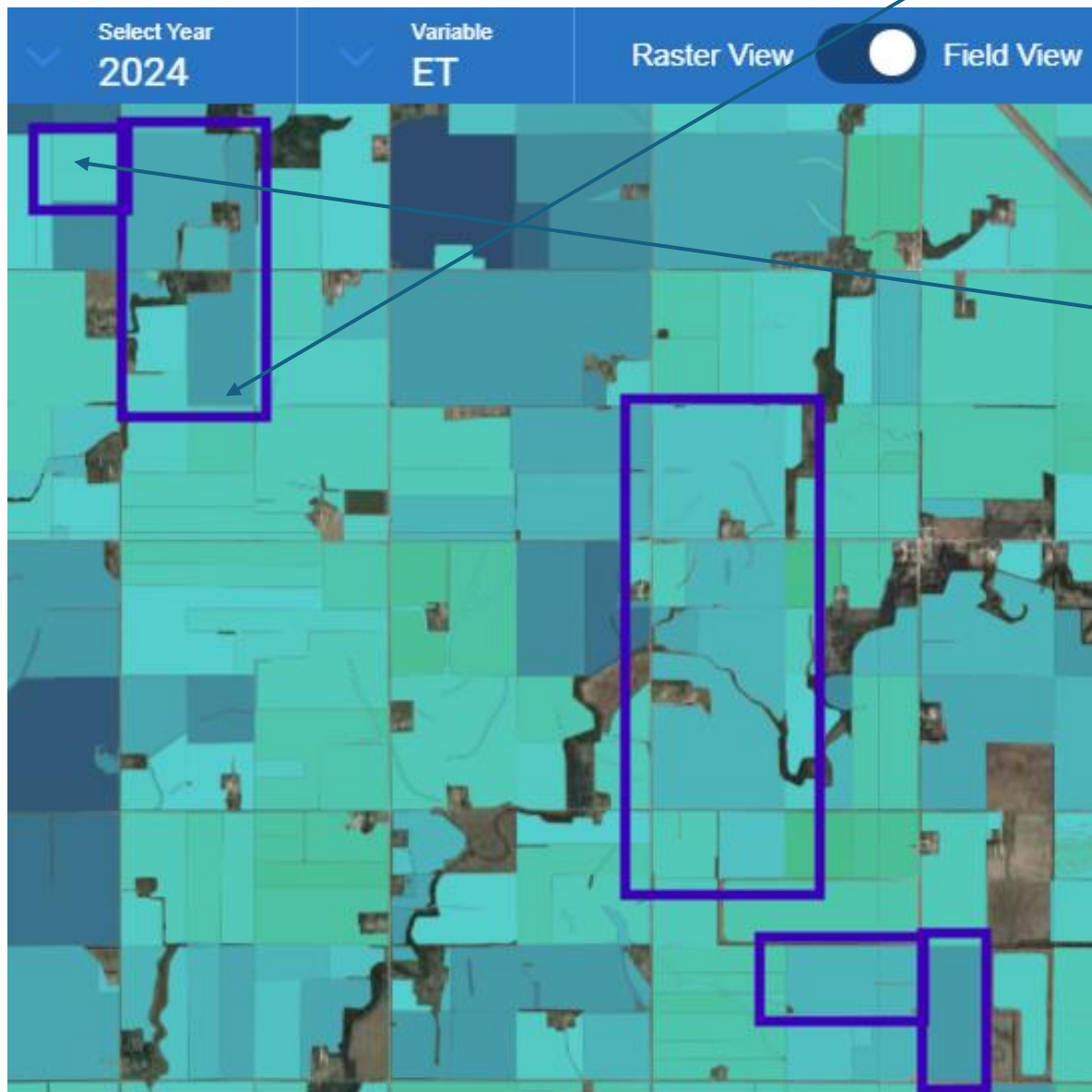
Harley West



Bartell South



OpenET



Jonas South (corn = 255bpa)
Water duty = 26bu/in of irr

2024 ET: 33 in

71.33 Acres

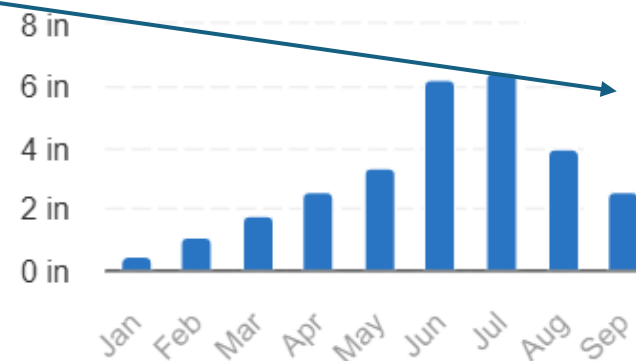
USDA/CDWR Crop Type: Soybeans



2024 ET: 29 in

20.14 Acres

USDA/CDWR Crop Type: Winter Wheat



Krehbiel 40 (corn = 50bpa)
Water duty = 6bu/in of rain

2024 ET: 40 in

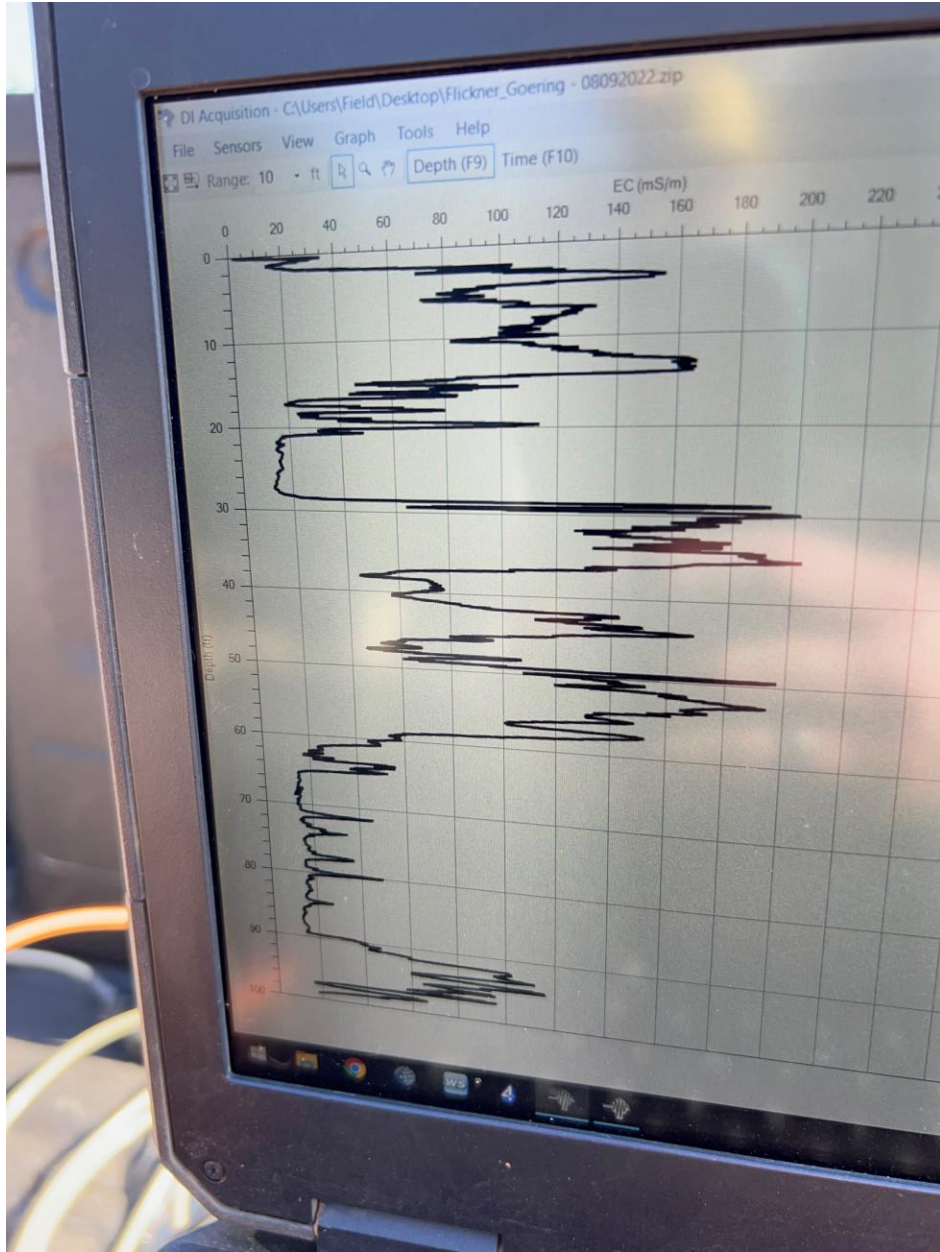
144.70 Acres

USDA/CDWR Crop Type: Corn



Highest ET in the neighborhood.
Corn. BPA = unknown.

Kansas Geological Survey – “direct push”







Types of Irrigation

- SDI on 60" and 40"
- Poly-pipe flood
- Natural flood
- Rotor pivot
- 360 Rain
- PMDI



Irrigation wetting pattern

Still allows
for rainfall
to soak in



**SDI every 40
inches**

**Irrigation wetting
pattern**



SDI installation video



SDI install pictures





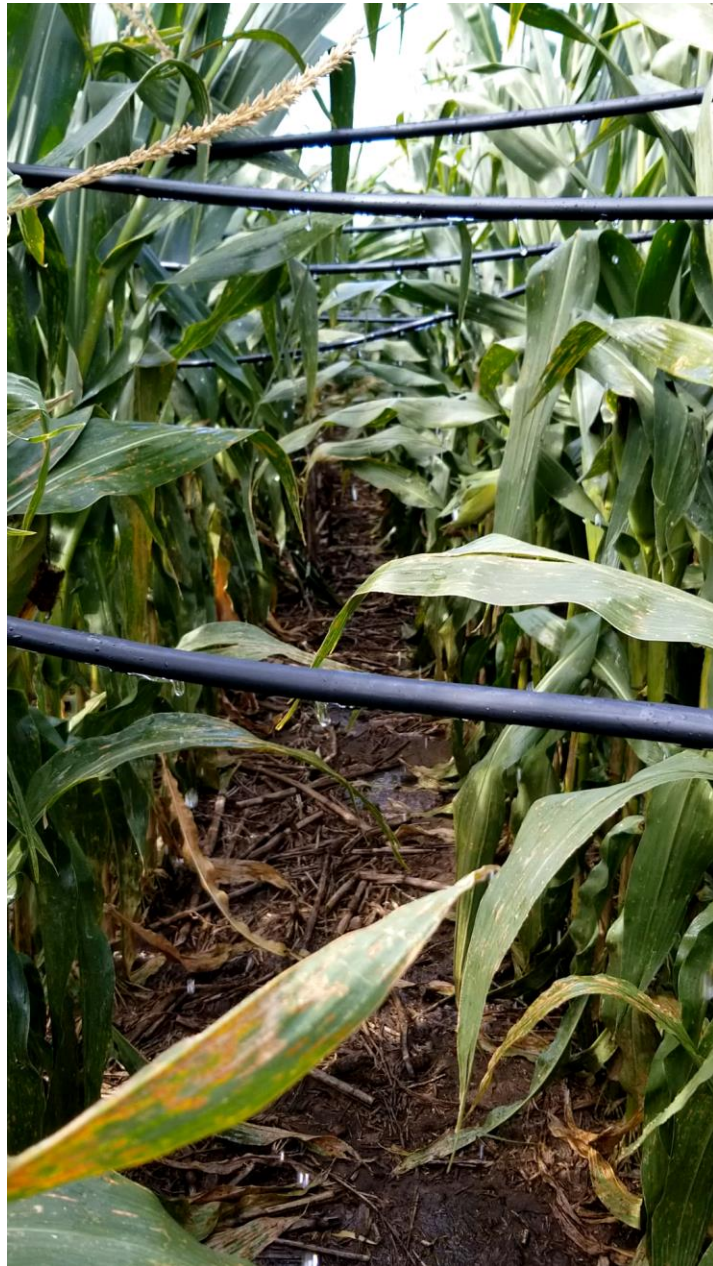
Precision Mobile drip Irrigation (PMDI)

6 spans on 20", 1 span on 30"

Windshield wiper pivot irrigations ~123 acres

PMDI





PMDI in action





360 Rain

- Manufactured by 360 Yield Center
- 60-foot boom
- Outside 30 feet irrigate “down”
- Inside 30 feet irrigated “back”
- Chemigation port
- Low end: volume water = 130gpm
- High end: volume water = 225gpm



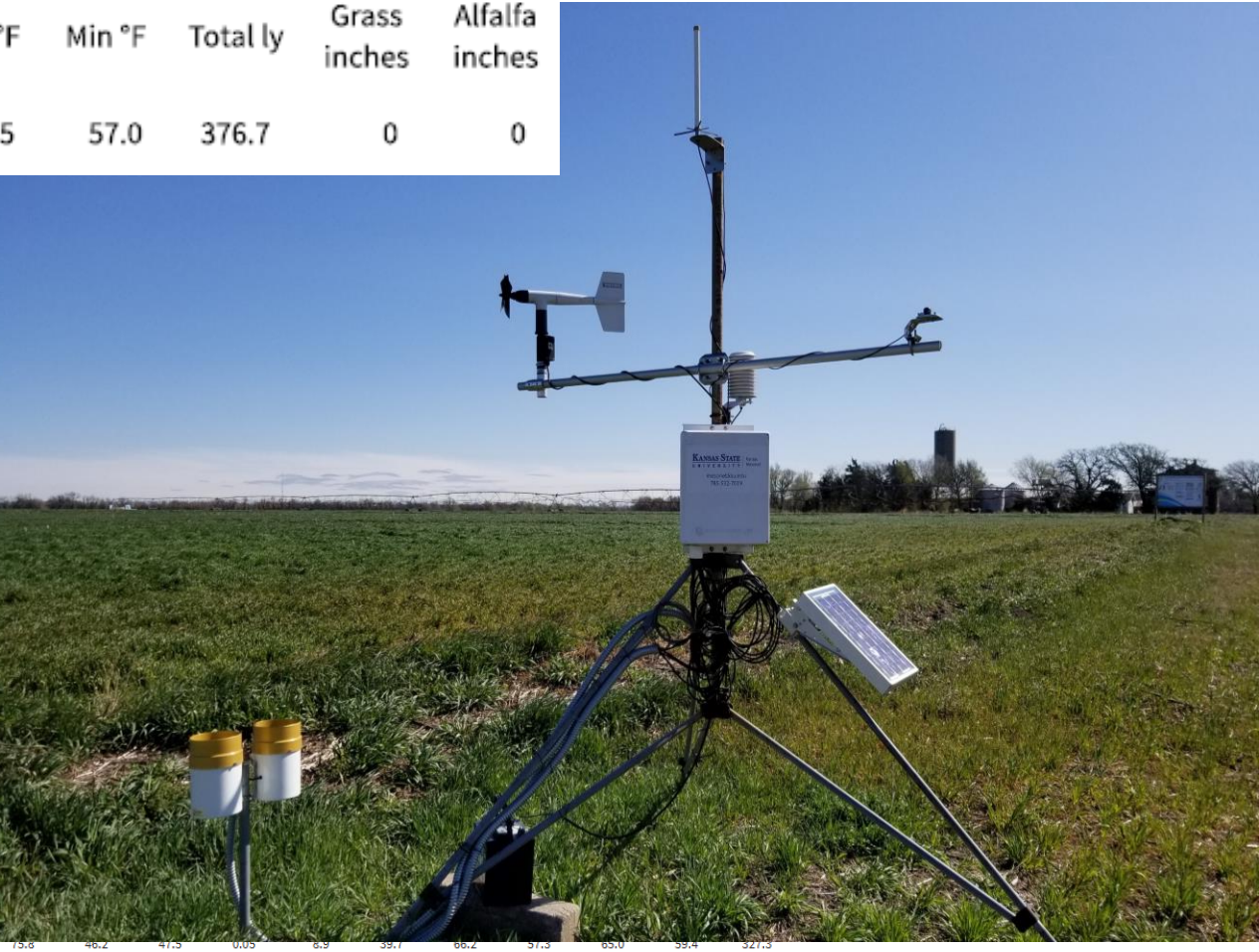
<https://mesonet.k-state.edu/>

Flickner Tech Farm

2024-01-01 — 2024-12-31

	Air Temperature		Relative Humidity	Precip	Wind Speed		2" Soil Temperature		4" Soil Temperature		Solar Radiation	ETo	
	Max °F	Min °F	Avg %	Total inches	Avg mph	Max mph	Max °F	Min °F	Max °F	Min °F	Total ly	Grass inches	Alfalfa inches
summary	70.7	45.2	65.2	26.15	6.9	46.0	64.6	55.9	63.5	57.0	376.7	0	0

04-01
04-02
04-03
04-04
04-05
04-06
04-07
Flickner Tec
2024-10-15
10-15
10-16
10-17
10-18
10-19
10-20
10-21
10-22
10-23
10-24
10-25
10-26
10-27
10-28
10-29
summary



Ways We Monitored Crop Stress

Plant Based



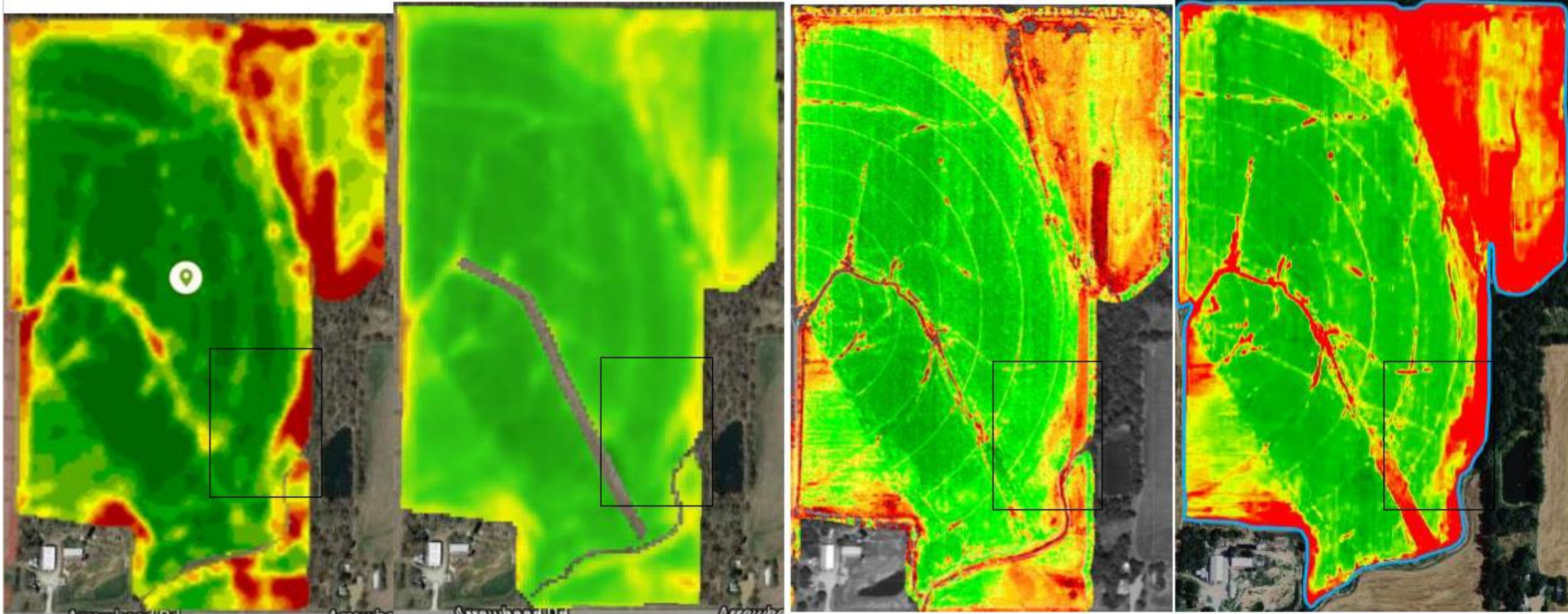
Ground
Moisture



Imagery



Imagery comparison = R7, ClimateView, Terravion, American Robotics



R7
7/19/2019

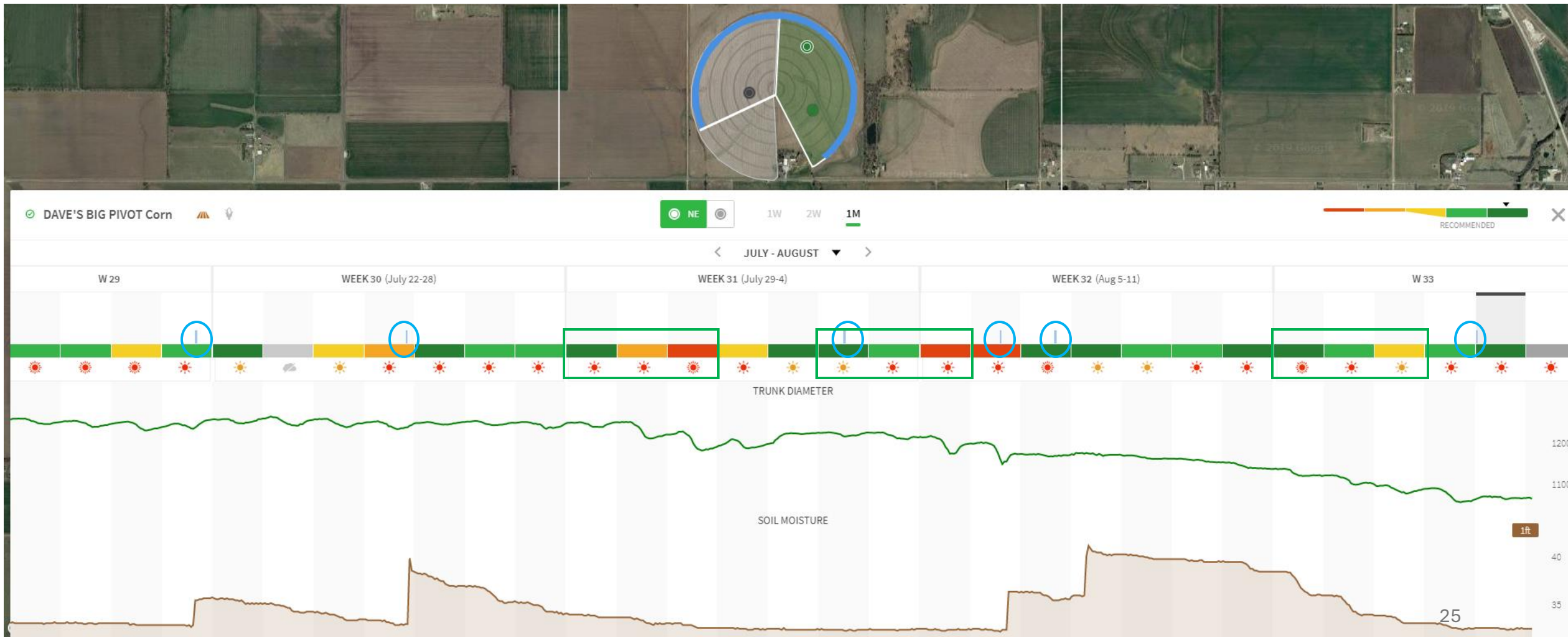
Climate
7/19/2019

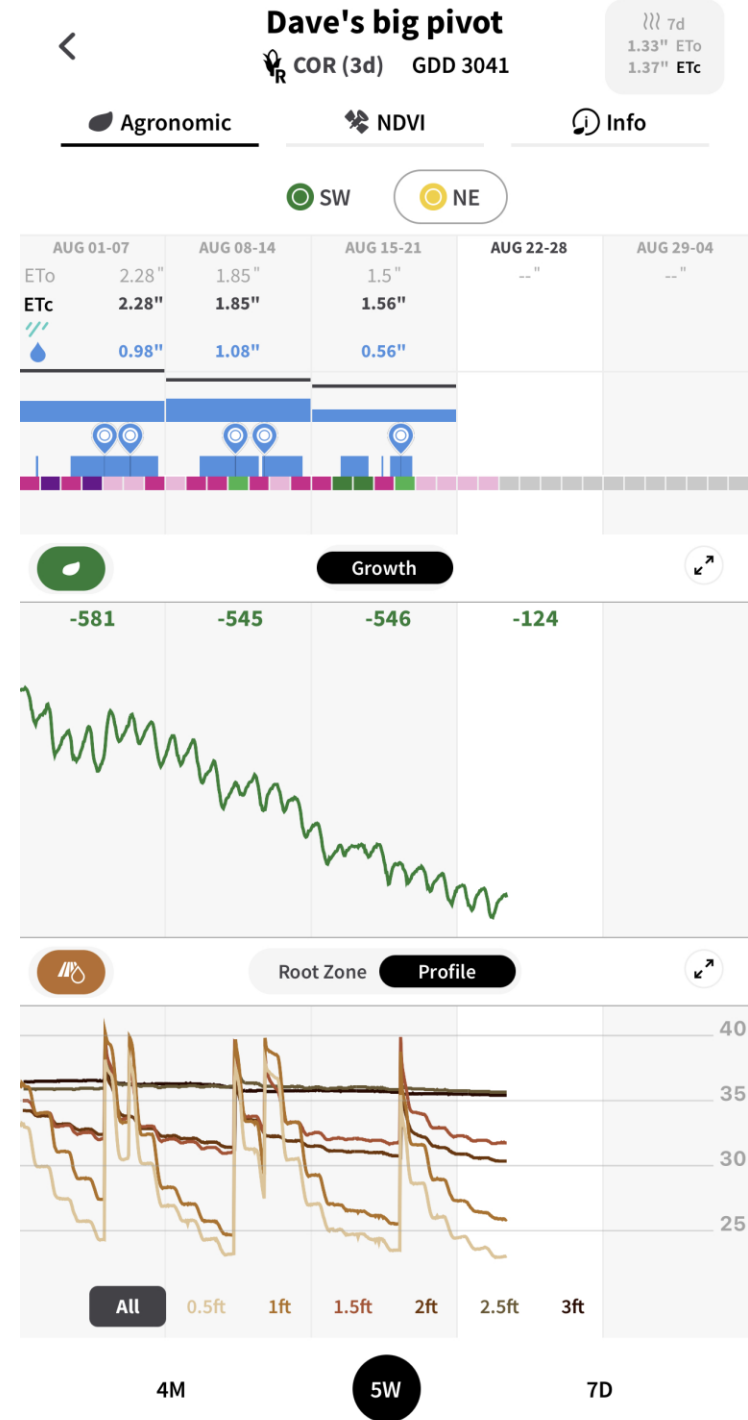
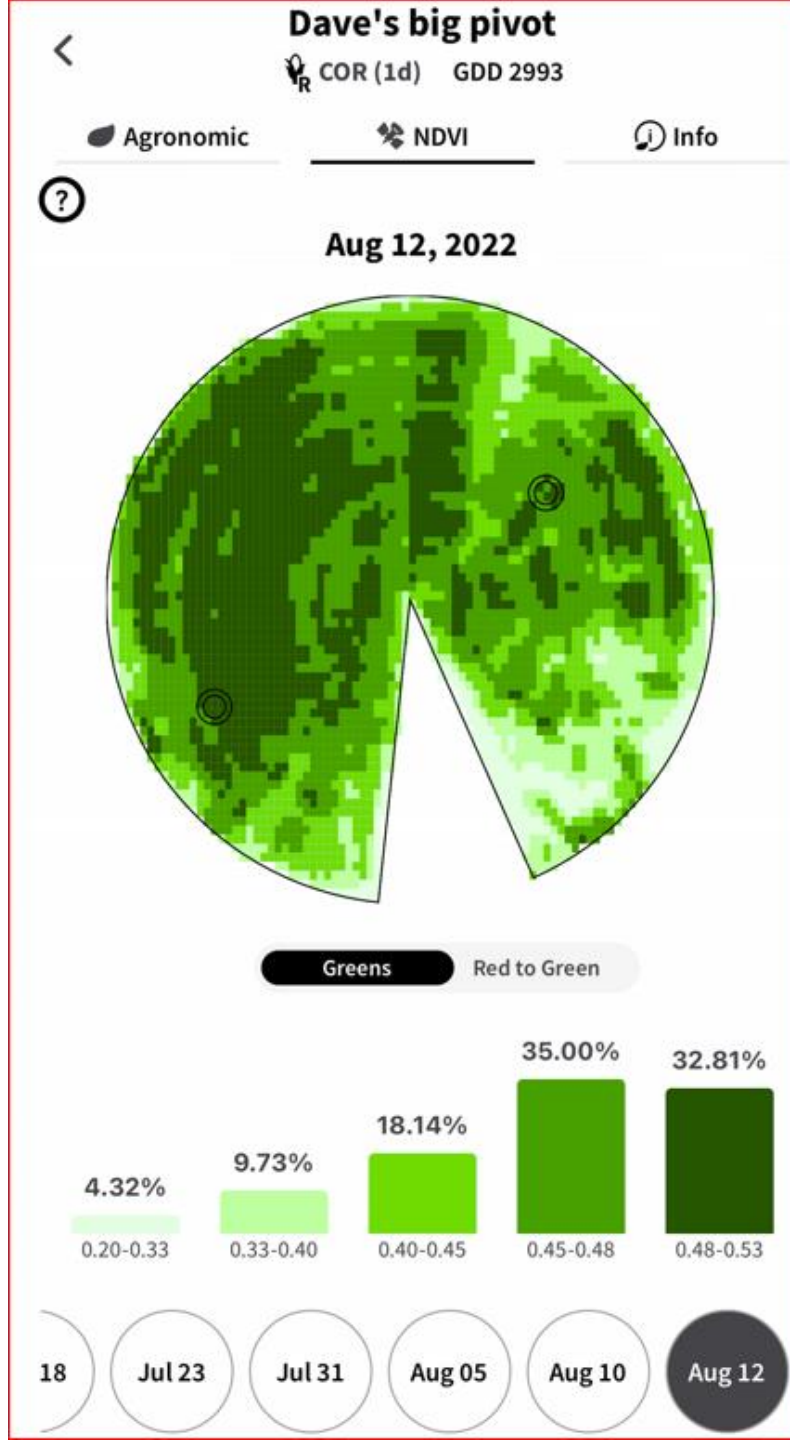
Terravion
7/18/2019

American Robotics
7/16/2019₂₃



Phytech – irrigation events; plant health





AG SPY™ KS 10665
 Raymond Flickner - Home Drip - Corn '19

Planted 04/12/2019
 Planted 04/18/2018
 Planted 07/10/2017

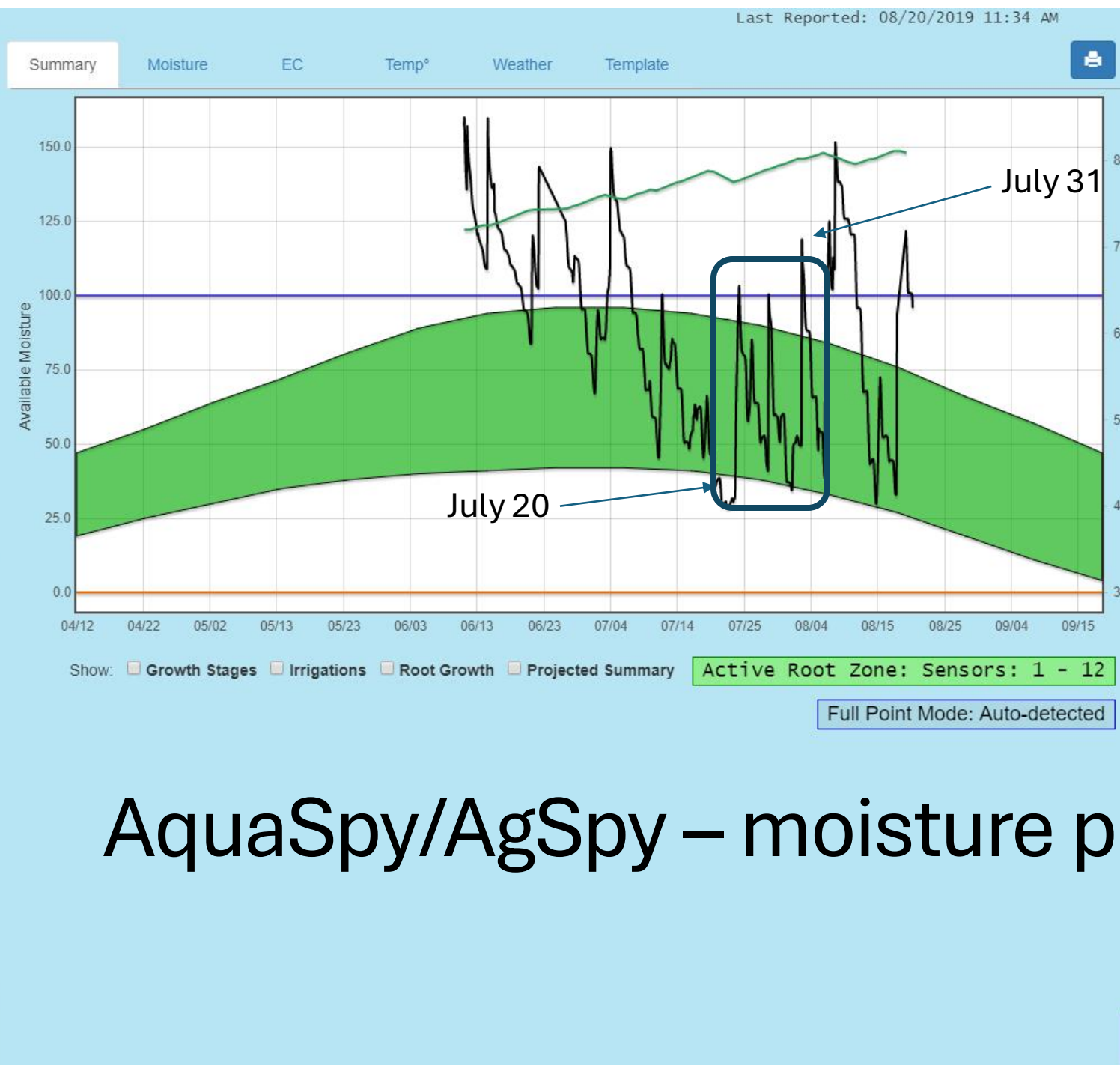
Create New Season

98.4°F Clear
 Humidity: 61.9%
 Dew Point: 83.1
 Wind: 11 mph SSW

Growing° Days: 611.2
 Last Irrigation/Rain: 08/14/2019 (44")
 Days to Refill: 9.0
 Root Depth: 48"

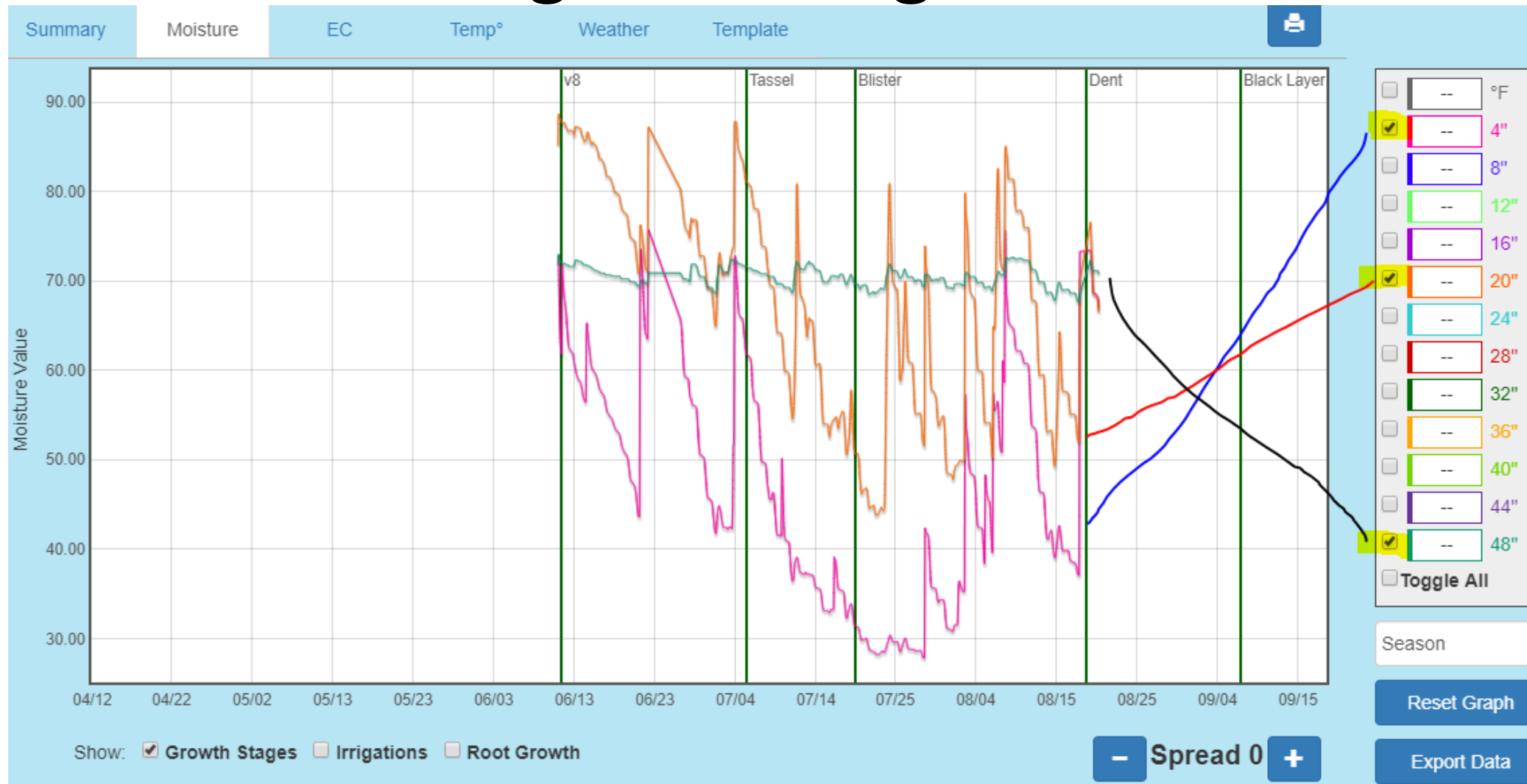
809

Conditions Notes



AquaSpy/AgSpy – moisture probe

AquaSpy – moisture levels at 4", 20", 48"; growth stages



Small pivot - 2023 End of Season Report

Small pivot – Raymond G Flickner

Location: 38°12'4" N, 277°34'10" W

Sprinkler Package Flow Rate: 500 gpm

Rotation Direction: CW

Fastest Circle: 10.8 hours

Area: 30 acres

Irrigation Strategy: Water Save

Total Rainfall: 13.18 in

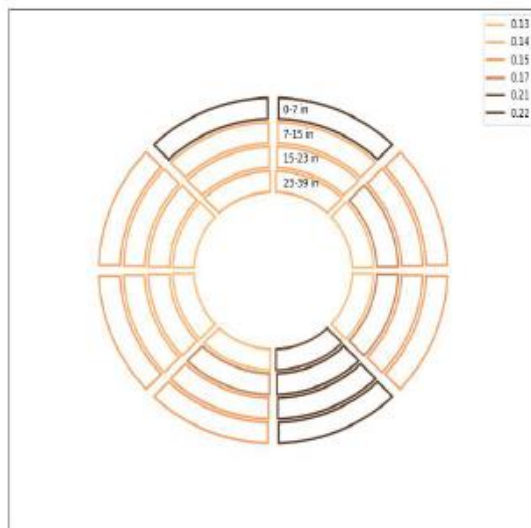
Total Irrigation: 9.97 in

Total ET Crop: 15.99 in

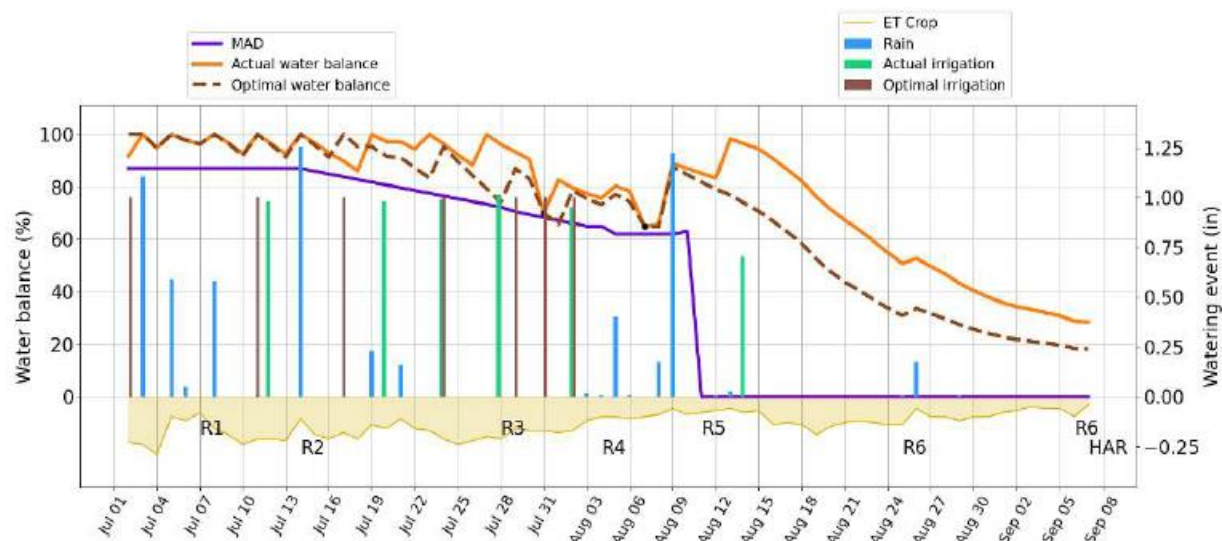
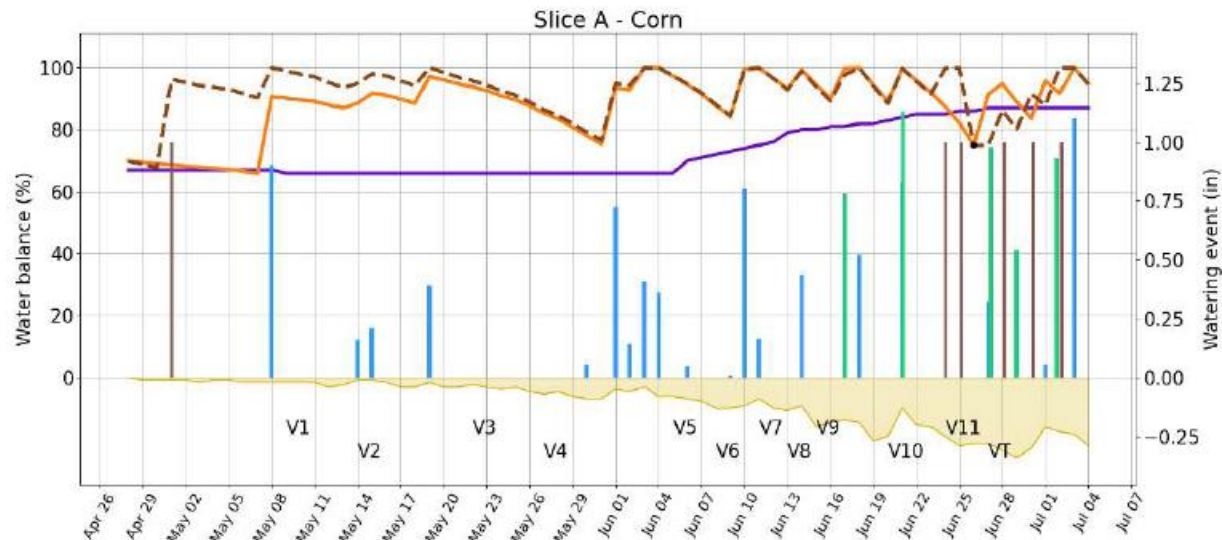
Total ET0: 28.16 in

Crop:

Soil AWHC:



Water Balance - Slice A (Corn):



2020 Soybeans: Harvest

Layer: Crude Protein

Gringo

Ray Flickner | Flickner Farms

Operation Dates: 10/14/2020 - 10/14/2020

Map

Satellite

AGRONOMIC DATA

TOTAL DRY YIELD

3,426.39 bu

AVG. WET WEIGHT

2,704.2 lb/ac

AVG. DRY YIELD

44.33 bu/ac

AVG. CRUDE PROTEIN

42.32 %

AVG. MSTR

12.75 %

MAX PROTEIN

63.83 %

AVG. SPEED

4.16 mi/h

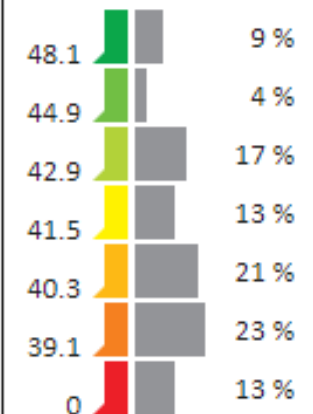
AREA WORKED

77.29 ac

WET WEIGHT

209,007.63 lb

LEGEND



Greenfield Robotics





Cover crop
versus no cover

Same field

Planted at same
time





November 2021



June 1, 2024



July 18, 2020



	% O.M.		
Depth	Native Pasture -- Goering 80 east	SDI crop -- Gringoe	Δ
0"	5.44	3.4	2.04
4"	3.27	2.1	1.17
12"	1.62	2.2	-0.58
26"	0.96	1.7	-0.74

Flickner Innovation Farm

Overview



Facebook

